

1.3 Raising Money

In *Variables and Patterns*, you looked at situations that involved *dependent* and *independent variables*. Because the distance walked depends on the time, you know distance is the dependent variable and time is the independent variable. In this problem, you will look at relationships between two other variables in a walkathon.

Getting Ready for Problem 1.3

Each participant in the walkathon must find sponsors to pledge a certain amount of money for each kilometer the participant walks.

The students in Ms. Chang's class are trying to estimate how much money they might be able to raise. Several questions come up in their discussions:

- What variables can affect the amount of money that is collected?
- How can you use these variables to estimate the amount of money each student will collect?
- Will the amount of money collected be the same for each walker? Explain.

Each student found sponsors who are willing to pledge the following amounts.

- Leanne's sponsors will pay \$10 regardless of how far she walks.
- Gilberto's sponsors will pay \$2 per kilometer (km).
- Alana's sponsors will make a \$5 donation plus 50¢ per kilometer.

The class refers to these as *pledge plans*.



A clipboard with a purple clip at the top holds a "Walkathon Pledge sheet" for Walker **Gilberto**. The sheet has a header section with a circular logo on the left and the title "Walkathon Pledge sheet" on the right. Below the title, it says "Walker **Gilberto**" and "Kilometers walked". The main body of the sheet is a table with four columns: "Sponsor's Name", "Donation", "Amount Pledged per Kilometer", and "Amount Paid". The "Donation" column has two rows with "\$ ____" and "\$ ____ Per Kilometer". The "Amount Pledged per Kilometer" column has two rows with "\$ ____ Per Kilometer" and "\$ ____ Per Kilometer". The "Amount Paid" column is empty. The table has several empty rows for additional entries. At the bottom right, there is a "Total" row with a "\$ ____" box.

Problem 1.3 Using Linear Relationships

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- A.**
1. Make a table for each student's pledge plan, showing the amount of money each of his or her sponsors would owe if he or she walked distances from 0 to 6 kilometers. What are the dependent and independent variables?
 2. Graph the three pledge plans on the same coordinate axes. Use a different color for each plan.
 3. Write an equation for each pledge plan. Explain what information each number and variable in your equation represents.
 4. **a.** What pattern of change for each pledge plan do you observe in the table?
b. How does this pattern appear in the graph? In the equation?
- B.**
1. Suppose each student walks 8 kilometers in the walkathon. How much money does each sponsor owe?
 2. Suppose each student receives \$10 from a sponsor. How many kilometers does each student walk?
 3. On which graph does the point (12, 11) lie? What information does this point represent?
 4. In Alana's plan, how is the fixed \$5 donation represented in
 - a. the table?
 - b. the graph?
 - c. the equation?
- C.** Gilberto decides to give a T-shirt to each of his sponsors. Each shirt costs him \$4.75. He plans to pay for each shirt with some of the money he collects from each sponsor.
1. Write an equation that represents the amount of money Gilberto makes from each sponsor after he has paid for the T-shirts. Explain what information each number and variable in the equation represents.
 2. Graph the equation for distances from 0 to 5 kilometers.
 3. Compare this graph to the graph of Gilberto's pledge plan in Question A, part (2).

ACE Homework starts on page 12.

